

Supporting Information OR Supplementary Data

1. Characterization of fluorescent nanoparticles

1.1 ATR-FTIR Spectroscopy

Synthesized polymeric nanoparticles were characterized using attenuated total reflectance-fourier transform infrared (ATR-FTIR) spectroscopy to study the functional groups on the surface of the particles on a Perkin Elmer spectrum one spectrometer. Washed and dried nanoparticles were kept on the diamond probe of the ATR for the spectroscopic analysis.

1.2 Fluorescence spectroscopy

1.2.1 Effect of particle size on fluorescent intensity

Synthesized nanoparticles were subjected to fluorescence analysis to study the influence of size on the FI intensity. Constant volume of all the nanoparticles was diluted in 3 mL of ultra pure water was taken. Whole particle number (N) and average number of pyrene molecule in one particle were theoretically calculated on the basis of size with the help of viscosity/light scattering method.

1.2.2 Effect of pH on fluorescent intensity

Influence of pH on the FI intensity of pyrene encapsulated in nanoparticles was studied in solutions with pH ranging from 1-12 prepared using 0.1 M sodium hydroxide (NaOH) and 0.1 M hydrochloric acid (HCl). 80 μ l or 4.46 mg of S1 FPNP were dispersed in the solutions with different pH ranging from 1 to 12 and FI intensity was immediately measured in the fluorimeter.

1.2.3 Effect of ionic strength on fluorescent intensity

80 μ l (4.46 mg) were diluted in 3 ml of solutions with different ionic strength maintained by sodium chloride (NaCl). The concentration of NaCl solution ranged from 0.5 to 0.3125 mol/mL and the fluorescent spectra of FPNP was recorded.

1.2.4 Effect of time on fluorescent intensity

Fluorescent intensity of FPNs was measured as a function of time and was compared with other fluorophores. 80 μL /3 mL (conc. 0.117×10^{-4} moles of pyrene/Kg of latex) of S1 FPNP solution was prepared in distilled water and its FI intensity was recorded at regular time intervals for five days. Other organic dyes FITC (1 mg/mL) and Rhodamine G (1 mg/mL) were measured along with pyrene solution prepared in toluene at the time. All solutions were kept in dark during the time dependent study to avoid photobleaching due to light.

Results and Discussion

ATR-FTIR spectroscopy

The ATR-FTIR spectra are shown in Figure 5.1 including of styrene, MMA, AAEM and synthesized S1 nanoparticles. The spectra showed the characteristic absorption peak at 1630 cm^{-1} of C=C stretching vibration of vinyl groups present in all the monomers. In the spectrum of FPNP the peak at 1636 cm^{-1} was vanished indicating the conversion of monomers to polymer during polymerization and the exhaustion of vinyl groups. In the spectra of AAEM the peak was observed at 1723 cm^{-1} which corresponds to C=O stretching vibration. The spectra of nanoparticles resembles the spectra of AAEM monomer and was observed to be very different from that of pure styrene indicating that the surface of nanoparticles is mainly formed of AAEM.

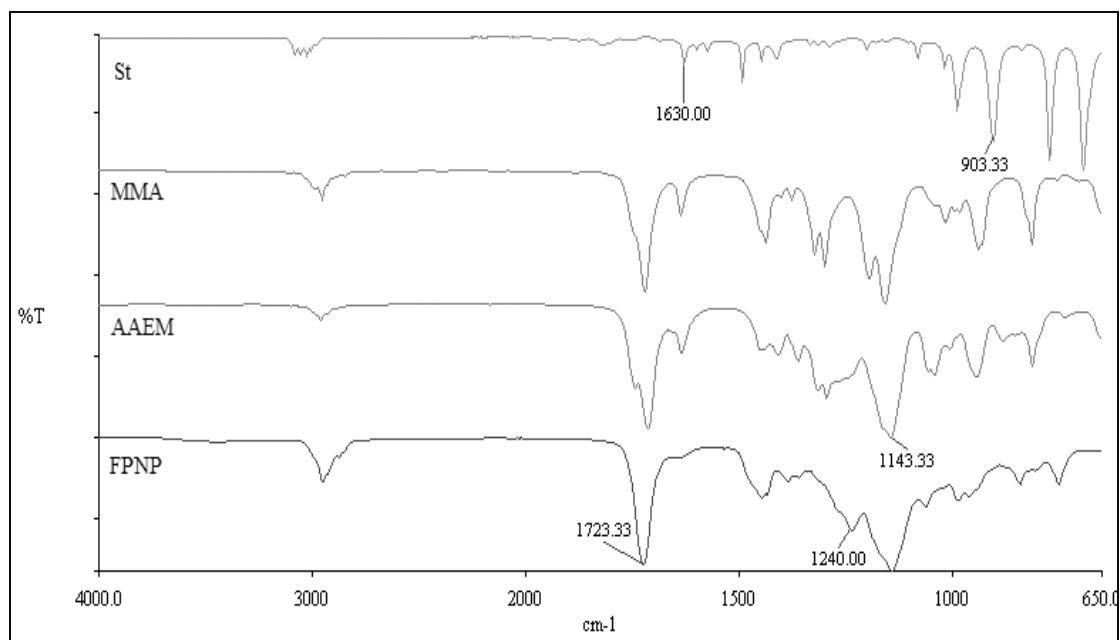


Figure S1 ATR-FTIR spectroscopic studies of synthesized nanoparticles